



COMMONWEALTH of VIRGINIA

*Marine Resources Commission
380 Fenwick Road
Building 96
Fort Monroe, VA 23651*

Jamie L. Green
Commissioner

2019 VIRGINIA COASTAL ZONE MANAGEMENT PROGRAM GRANT TASK 9

Project Title: York River Oyster Restoration

LEGAL APPLICANT

Name: Virginia Marine Resources Commission
Organization: Virginia Marine Resources Commission
380 Fenwick Road, Bldg. 96
Fort Monroe, VA 23651-1064

Project Manager: Andrew Button

Title: Deputy Chief, Shellfish Management
Division

Product #3 Final Report

The Chesapeake Bay Watershed Agreement (Agreement) set a goal of restoring oyster populations in 10 tributaries by the year 2025. In Virginia, oyster restoration partners working together as the Virginia Interagency Oyster Team selected the Lower York River as one of these tributaries.

In the Lower York River, the partners developed an estimate of currently restorable oyster habitat for the river and then, taking into consideration the established Bay-wide oyster restoration metrics, set a goal of restoring 200 acres. Due to past restoration work, 35 acres of reefs in this tributary already met the definition of restored. The Virginia Marine Resources Commission (VMRC), in combination with other partners, has been involved with the construction or planning of most of these acres. The funds provided in this task supported VMRC in restoring a significant amount acreage towards the overall goal.

1 Good or above average recruitment on crushed stone

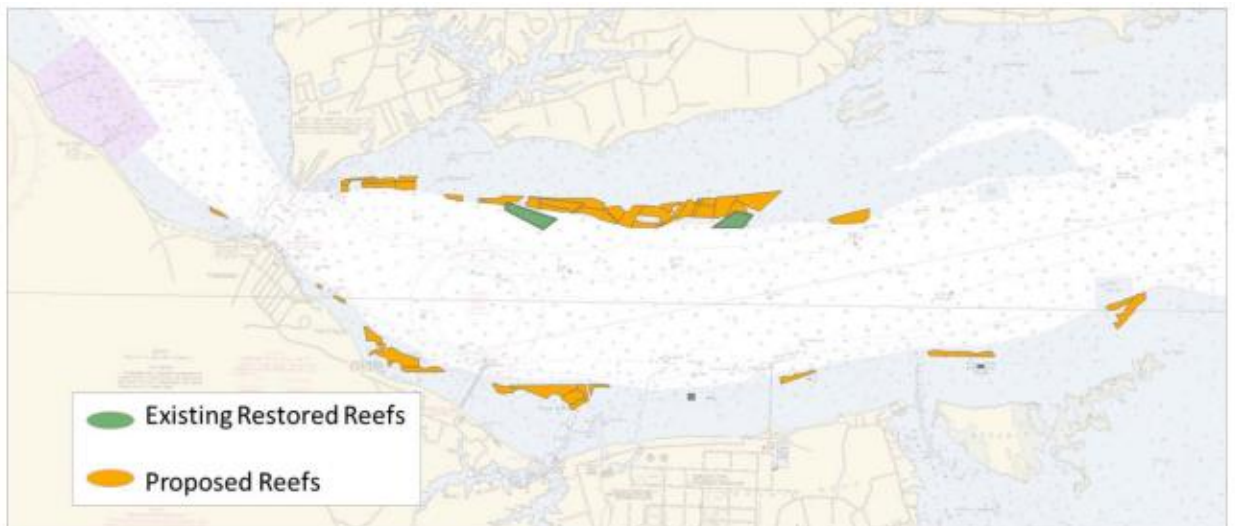
CZM funding was used to procure and deploy approximately 4,308 tons of crushed granite stone in the Lower York River. This provided the substrate required for the construction of approximately 17.2 acres of reef habitat. In addition to the acreage constructed using funding from this award, an additional 153 acres of reefs will be constructed in the Lower York by the late Spring of 2023. This effort, combined with past efforts, will hit the re restoration target set under the Agreement for the lower York to be considered "fully restored". Of the 153 acres currently

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planned, approximately 143 were fully constructed in 2022, due to several weather delays, and to continue to take advantage of natural recruitment the final 10 acres of planned reefs will be completed in the late spring of 2023.



A GIS layer of all proposed reefs in the lower York and those constructed by VMRC has been created and is currently housed in a data base maintained by NOAA CBO. For the most up to date copy of this database David Bruce is the point of contact at NOAA CBO david.bruce@noaa.gov . A KMZ layer of the 153 acres of reefs constructed will have been provided for inclusion in this database.

The 153 acres of reefs constructed were a combination of higher and lower relief reefs. For higher relief reefs approximately 1000 tons of stone was deployed per acre using a crane and bucket. For lower relief areas, material was deployed by washing stone from a continually moving barge using high pressure water cannons at a target rate of 200-300 tons per acre. Images of Post-construction surveys of high relief reefs are included at the end of this report.

Prior to construction, bottom/sediment type was determined using data provided by NOAA collected using side scan sonar. Bottom type/hardness was confirmed with field samples and probes by VMRC staff. Harder sandy bottom was selected for higher relief reefs and firmer bottom with some evidence or presence of oyster shell and some live oysters was targeted for lower relief construction. Deploying



material in a thinner layer directly onto a depleted, but existing oyster resource is the technique that has been used successfully by VMRC for decades to maintain oyster populations on harvest areas or to increase oyster populations in sanctuary areas with some, but limited oyster habitat.

The reefs constructed with this and other funding in the Lower York will be incorporated into the ongoing and long running stock assessment conducted jointly by The Virginia Institute of Marine Science (VIMS) and VMRC. As of the writing of this report, monitoring has not yet been completed. However, anecdotal reports and monitoring in other areas indicates that 2022 was an above average year for spat or juvenile oyster recruitment in Virginia. After and areas have been monitored for 5 or more years the data and summary information is available on the [VOSARA](#) site. Monitoring data is also provided to our restoration partners and can be provided to DEQ CZM prior to these 5 years being compiled upon request and when completed.

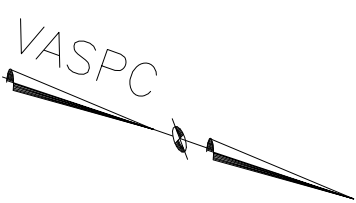
Thanks in part to grants and funding such as that provided in this opportunity, the oyster restoration goals established in the Agreement are likely to be met by 2025. Unfortunately, most of the other stated goals of the Agreement are not. The cooperative agreements, work groups and partnerships that have kept the oyster restoration target on track should serve as an example going forward to other partners involved in the larger restoration effort. It is hoped the oyster restoration


success may help to provide a catalyst for the many concurrent and shared goals of the CZM program and others. The long-term success of the current oyster restoration effort will largely be determined by the success of those goals and targets that are not currently on track to be met in the stated time frame but are critical to the health of the entire watershed.

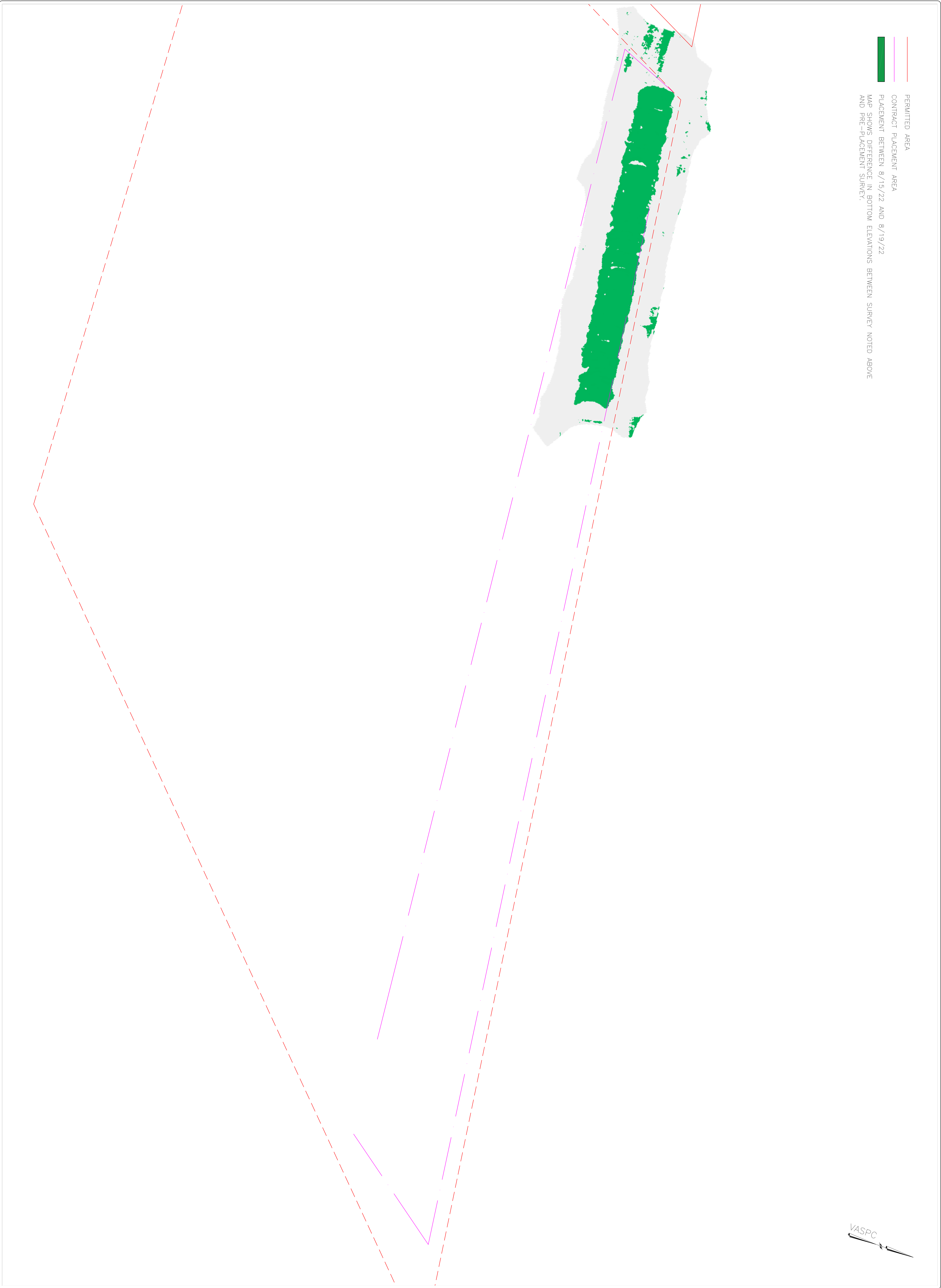




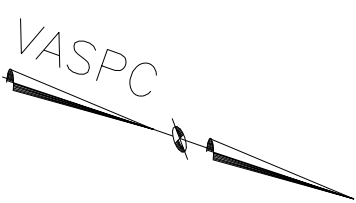
PERMITTED AREA
CONTRACT PLACEMENT AREA
PLACEMENT BETWEEN 7/13/22 AND 8/10/22
MAP SHOWS DIFFERENCE IN BOTTOM ELEVATIONS BETWEEN SURVEY NOTED ABOVE
AND PRE-PLACEMENT SURVEY.



SHEET 1 OF 1	DRAWING NO 001	MAMC FILE NAME 2215.220810	VIRGINIA MARINE RESOURCE COMMISSION YORK RIVER PLANTING YORKTOWN, VA	H: STATE PLANE NAD-83 VIRGINIA SOUTH V: HII-NNS DATUM, 98.55'±0.0' MLW 1983-2001 NTDE UNITS: FEET SURVEY DATE: AUGUST 10, 2022 VESSEL: BAYLEIGH W. ECHOSOUNDER: RESON T20 MULTIBEAM OPERATING AT 200 kHz GPS: APPLANIX POSMV WAVEMASTER CORRECTIONS: VRS RTK NETWORK		 21344 MALLARD COVE LANE CARROLLTON, VA 23314 TEL: 757-412-8375 FAX: 757-257-7006
	SCALE NA	DATE AUGUST 15, 2022	ZONE 2 PROGRESS SURVEY			
	DRAWN BY DM					



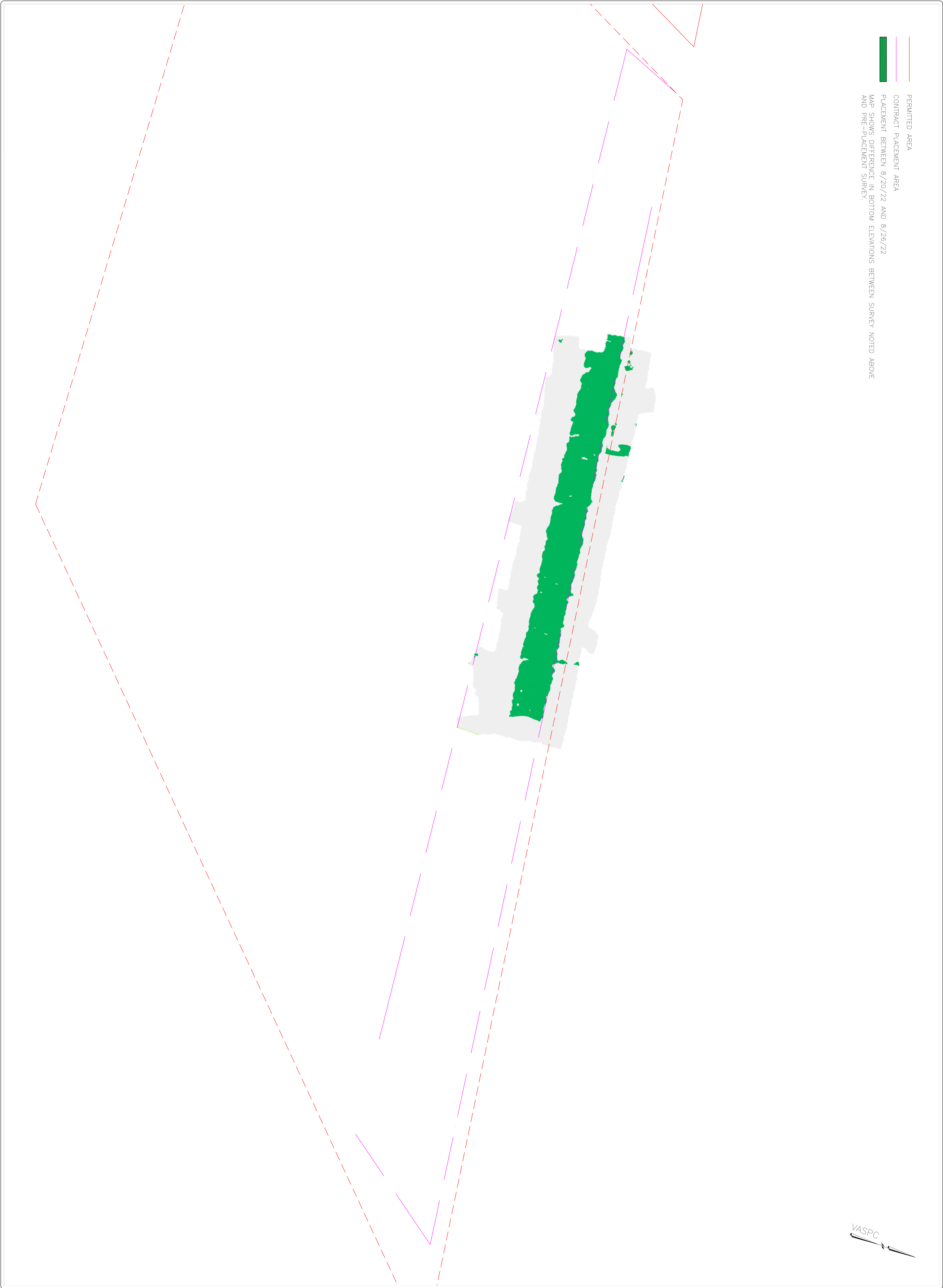
PERMITTED AREA
CONTRACT PLACEMENT AREA
PLACEMENT BETWEEN 8/15/22 AND 8/19/22
MAP SHOWS DIFFERENCE IN BOTTOM ELEVATIONS BETWEEN SURVEY NOTED ABOVE
AND PRE-PLACEMENT SURVEY.



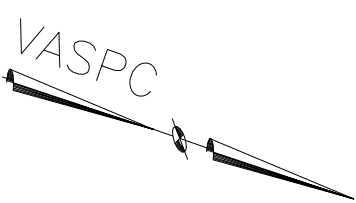
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		DRAWN BY	DM	
		DATE	AUGUST 22, 2022	
		ZONE 1 PROGRESS SURVEY		

MID-ATLANTIC MARINE CORP.	H: STATE PLANE NAD-83 VIRGINIA SOUTH
	V: HII-NNS DATUM, 98.55'±0.0' MLW 1983-2001 NTDE
	UNITS: FEET
	SURVEY DATE: AUGUST 22, 2022
	VESSEL: BAYLEIGH W.
	ECHOSOUNDER: RESON T20 MULTIBEAM OPERATING AT 200 kHz
	GPS: APPLANIX POSMV WAVEMASTER
CORRECTIONS: VRS RTK NETWORK	

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PERMITTED AREA
CONTRACT PLACEMENT AREA
PLACEMENT BETWEEN 8/20/22 AND 8/26/22
MAP SHOWS DIFFERENCE IN BOTTOM ELEVATIONS BETWEEN SURVEY NOTED ABOVE
AND PRE-PLACEMENT SURVEY.



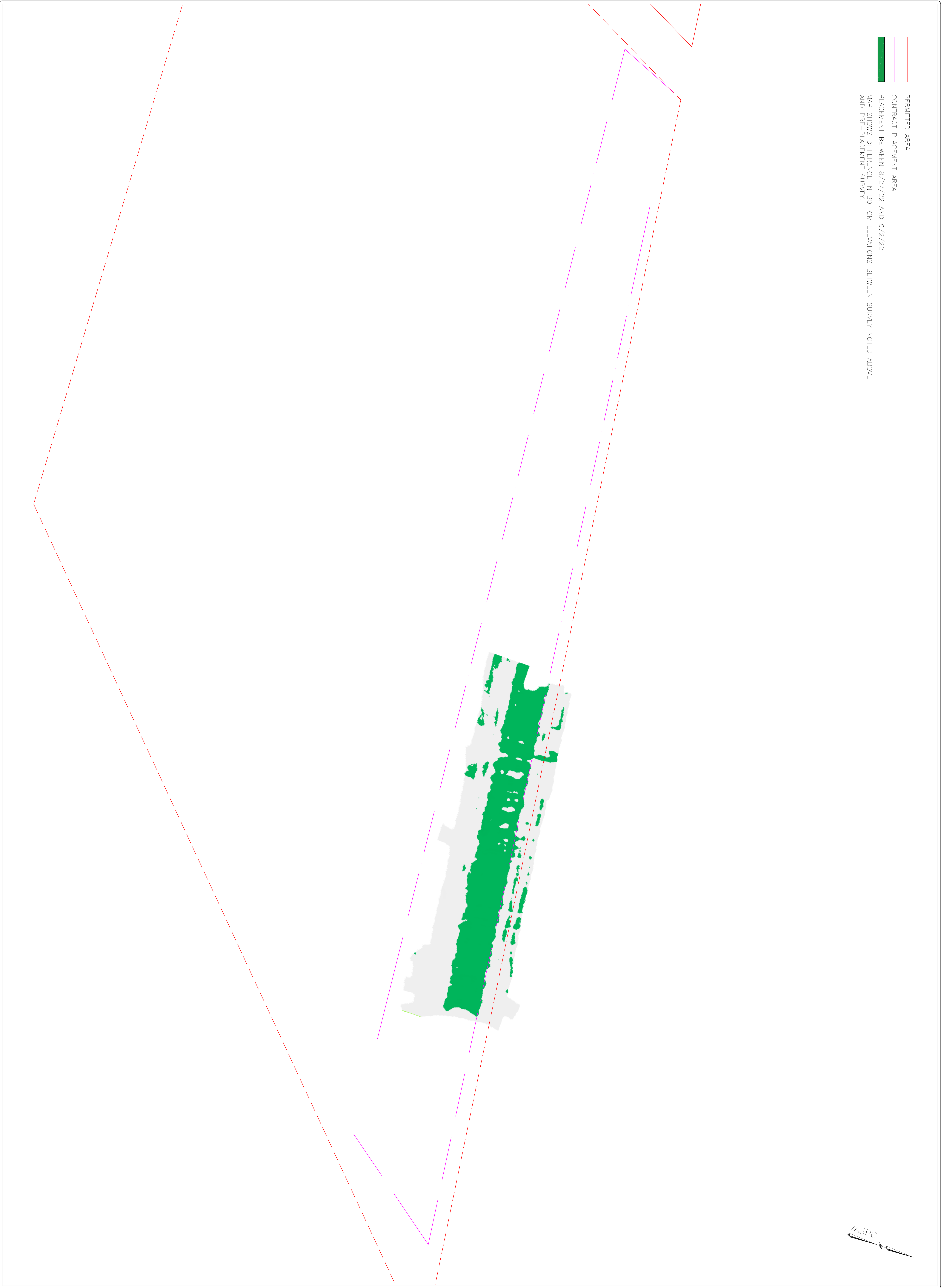
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		SCALE NA	
		DRAWN BY DM	
		DATE AUGUST 22, 2022	

MID-ATLANTIC MARINE CORP.	H: STATE PLANE NAD-83 VIRGINIA SOUTH
	V: HII-NNS DATUM, 98.55'±0.0' MLW 1983-2001 NTDE
	UNITS: FEET
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	VESSEL: BAYLEIGH W.
	ECHOSOUNDER: RESON T20 MULTIBEAM OPERATING AT 200 kHz
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CORRECTIONS: VRS RTK NETWORK	

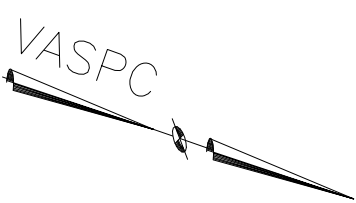
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21344 MALLARD COVE LANE
CARROLLTON, VA 23314
TEL: 757-412-8375 FAX 757-257-7006



PERMITTED AREA
CONTRACT PLACEMENT AREA
PLACEMENT BETWEEN 8/27/22 AND 9/2/22
MAP SHOWS DIFFERENCE IN BOTTOM ELEVATIONS BETWEEN SURVEY NOTED ABOVE AND PRE-PLACEMENT SURVEY.

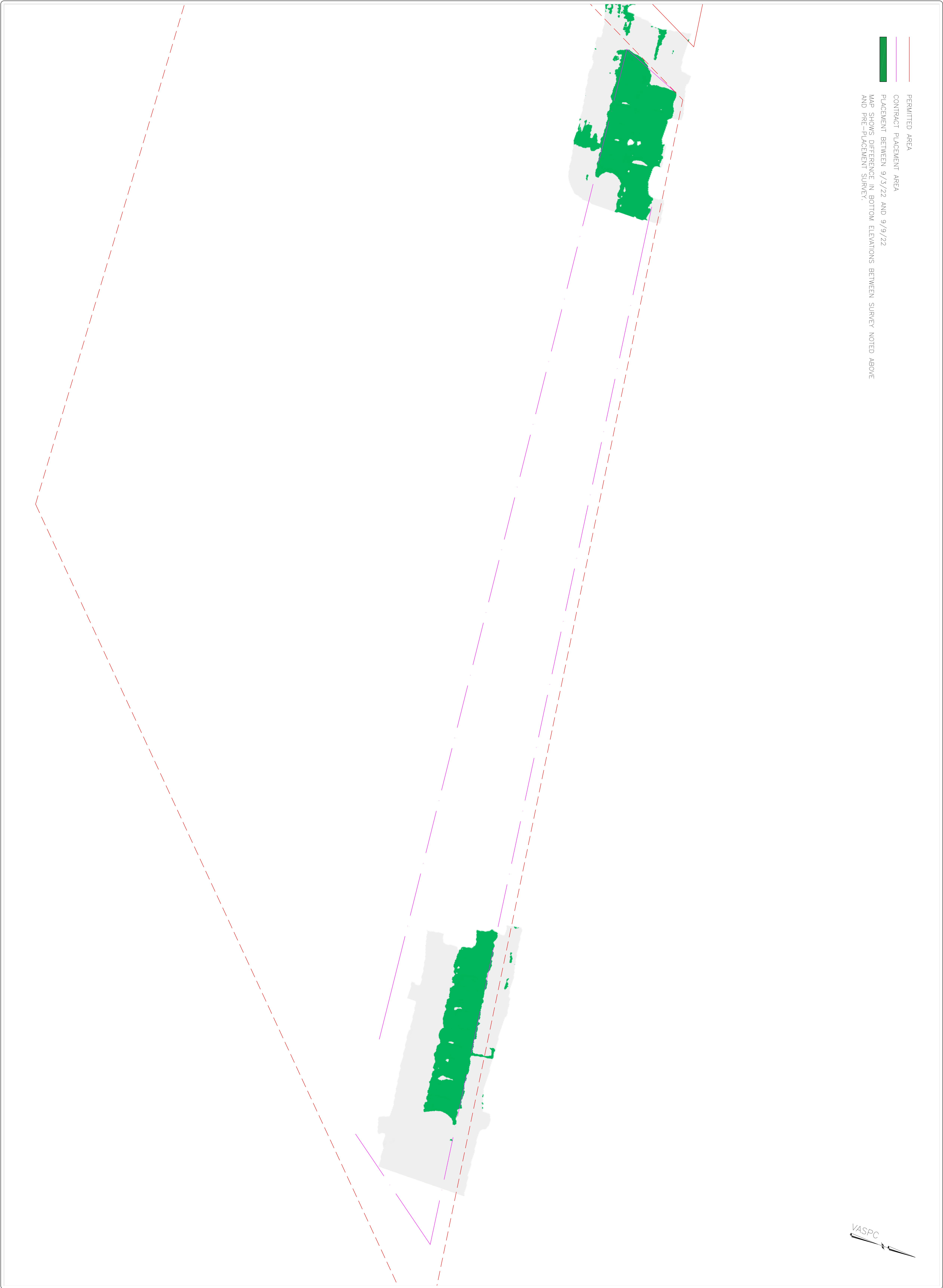


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	DRAWN BY	DM	
	DATE	SEPTEMBER 6, 2022	
SHEET 1 OF 1			

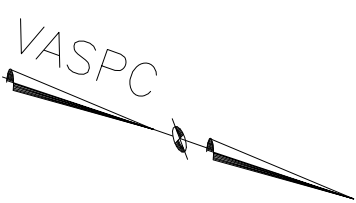
PROJECT INFORMATION	H: STATE PLANE NAD-83 VIRGINIA SOUTH
	V: HII-NNS DATUM, 98.55'±0.0' MLW 1983-2001 NTDE
	UNITS: FEET
	SURVEY DATE: SEPTEMBER 6, 2022
	VESSEL: BAYLEIGH W.
	ECHOSOUNDER: RESON T20 MULTIBEAM OPERATING AT 200 kHz
	GPS: APPLANIX POSMV WAVEMASTER
	CORRECTIONS: VRS RTK NETWORK

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PERMITTED AREA
CONTRACT PLACEMENT AREA
PLACEMENT BETWEEN 9/3/22 AND 9/9/22
MAP SHOWS DIFFERENCE IN BOTTOM ELEVATIONS BETWEEN SURVEY NOTED ABOVE
AND PRE-PLACEMENT SURVEY.

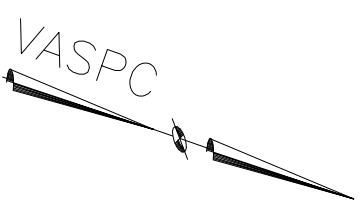


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	DRAWN BY	DM	
	DATE	SEPTEMBER 13, 2022	
	SHEET 1 OF 1		

PROJECT INFORMATION	H: STATE PLANE NAD-83 VIRGINIA SOUTH
	V: HII-NNS DATUM, 98.55'±0.0' MLW 1983-2001 NTDE
	UNITS: FEET
	SURVEY DATE: SEPTEMBER 13, 2022
	VESSEL: BAYLEIGH W.
	ECHOSOUNDER: RESON T20 MULTIBeam OPERATING AT 200 kHz
	GPS: APPLANIX POSMV WAVEMASTER
CORRECTIONS: VRS RTK NETWORK	

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SHEET 1 OF 1	DRAWING NO 001	MAMC FILE NAME 2215.221007	VIRGINIA MARINE RESOURCE COMMISSION YORK RIVER PLANTING YORKTOWN, VA ZONE 1 PROGRESS SURVEY
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		DATE OCTOBER 18, 2022	

PROJECT INFORMATION	H: STATE PLANE NAD-83 VIRGINIA SOUTH
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	UNITS: FEET
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	VESSEL: BAYLEIGH W.
	ECHOSOUNDER: RESON T20 MULTIBEAM OPERATING AT 200 kHz
	GPS: APPLANIX POSMV WAVEMASTER
	CORRECTIONS: VRS RTK NETWORK

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